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Becoming Positive about BeingCarbon Neutral:Requiring Public Accountability forInternet Companies

Alexandra L. Pichette

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ABSTRACT

Every year, worldwide dependence on Internet and other information technology services grows. In many ways, the increased use of electric energy is positive for the environment; after all, using the Internet to access a document uses less energy than printing and distributing that document. Nonetheless, Internet companies expend a great deal of energy when they, for example, fire up their servers to satisfy a search request. Studies show that Internet companies are disproportionately large energy consumers, and are responsible for a growing number of carbon emissions. As a result, environmentalists are becoming concerned about the effects of these emissions on climate change. Despite this concern, Internet companies' carbon emissions are not only unregulated, they are largely unknown: because the emissions are indirect—or "Scope 2"—they are not included in the EPA's mandatory reporting requirement for large-scale, direct emissions. Because Internet companies lack incentive to report their own numbers, policymakers do not receive accurate data regarding these emissions. Internet companies also make unverified claims about their "greenness," potentially influencing public choice unfairly. In addition to being potentially unethical, companies claiming that they are "green" without having to show establishment of more efficient energy procedures, will not be incentivized to reduce their emissions. This Note advocates for a federal, mandatory reporting requirement that encompasses Scope 2 emissions.

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In 2008, a *London Times* article caused a controversy in the technological community by suggesting that a typical Google search emits about seven grams of carbon.[1] This estimate implicates all Internet companies, a term that refers broadly to companies that make use of information technology and various cloud and Internet

1. Jonathan Leake & Richard Woods, *Google and You'll Damage the Planet*, SUNDAY TIMES, Jan. 11, 2009, at 6.

services.[2] The estimate has large implications: Despite the fact that Internet companies consume large amounts of electricity,[3] their carbon emissions escape government regulation because they are classified as "indirect" rather than "direct."[4]

Direct, or "Scope 1," emissions result from the activities of an entity, such as the emissions produced by a coal burning factory or those of a power company.[5] Indirect, or "Scope 2," emissions are "emissions that are a consequence of the activities of the reporting entity, but occur at sources owned or controlled by another entity."[6] For example, a consumer might buy energy from a power company to heat her house in the winter, which her monthly electric bill will reflect. The power company from which she buys the energy has produced Scope 1 emissions by providing that energy, while the consumer uses, or consumes, the Scope 2 emissions created by the power company when she turns up her thermostat. Each customer of that utility company will have a similar electric bill. A public or private entity attempting to measure the total amount of emissions used in this transaction can either measure how many total emissions the power company generates (Scope 1 emissions), or it can measure the total amount of energy each customer consumed (Scope 2 emissions). In this scenario, mandating the disclosure of only Scope 1 emissions may seem more efficient because it requires one measurement instead of many measurements. Ultimately, this method of measurement will expose a factory that emits a disproportionately large amount of carbon emissions. However, it will not expose a single consumer who uses—and thus creates a demand for—a disproportionately large amount of carbon emissions. Just like the individual electricity users, Internet companies use substantial

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2. *See* GARY COOK & JODIE VAN HORN, GREENPEACE INT'L, HOW DIRTY IS YOUR DATA?: A LOOK AT THE ENERGY CHOICES THAT POWER CLOUD COMPUTING 7 (Apr. 2011), *available at* http://www.greenpeace.org/international/Global/international/publications/climate/2011/Cool%20IT/dirty-data-report-greenpeace.pdf (comparing the green practices of companies, including: Akamai, Amazon, Apple, Facebook, Google, Hewlett Packard, IBM, Microsoft, Twitter, and Yahoo!). Google is frequently referenced, not because it necessarily uses the most energy, but because it is particularly successful and visible. *See infra* text accompanying notes 55-59 (discussing the focus on Google).

3. *See* COOK & VAN HORN, *supra* note 2, at 1 ("Data centres to house the explosion of virtual information currently consume 1.5-2 percent of all global electricity.").

4. *See infra* text accompanying notes 5-11.

5. *EPA's Greenhouse Gas Emission Reductions*, U.S. ENVTL. PROT.AGENCY, http://www.epa.gov/greeningepa/ghg (last updated Aug. 16, 2011) (defining Scope 1 emissions); *FAQ*, GREENHOUSE GAS PROTOCOL, http://www.ghgprotocol.org/calculation-tools/faq (last visited Nov. 1, 2011).

6. *FAQ*, GREENHOUSE GAS PROTOCOL, http://www.ghgprotocol.org/calculation-tools/faq (last visited Nov. 1, 2011).

amounts of energy, but indirectly, because they buy the energy that runs their servers (Scope 2) instead of producing it directly (Scope 1).[7]

The US Environmental Protection Agency (EPA) has exercised its authority to regulate greenhouse gas (GHG) emissions, including carbon, under the Clean Air Act (CAA).[8] In 2009, the EPA finalized a rule that requires facilities to publicize their *direct* carbon emissions if the emissions result from one of thirty source categories, or exceed 25,000 metric tons per year of carbon dioxide equivalent.[9] This information will eventually be included in a publicly accessible carbon registry, designed to give policymakers a more accurate picture of the main contributors to climate change.[10] Internet companies escape this reporting rule because the EPA did not include large-scale Scope 2 emissions,[11] and Internet companies emit relatively few direct, or Scope 1 emissions.[12]

Although the effect known as climate change[13] continues to be a divisive issue, a significant portion of the scientific community has agreed that a buildup of carbon dioxide and other gases is contributing to unprecedented alterations in the earth's atmosphere.[14] Some uncertainties remain about the timing, pace, magnitude, and distributions of its impacts, but the scientific community has largely agreed that climate change will negatively impact the earth.[15] Climate scientists fear that carbon buildup will lead to "potentially vast environmental and economic damage" in addition to disruption of the earth's ecosystems, a rise in sea level, and increased drought.[16]

A growing body of evidence indicates that Internet companies are responsible for a disproportionately large amount of carbon emissions.[17] For this reason, it is likely that Internet companies will

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7. *See infra* note 71 and accompanying text.

8. *See* Clean Air Act, 42 U.S.C. §§ 7401-7671q (2006); *see also infra* notes 67-70 and accompanying text (discussing Massachusetts v. EPA, 549 U.S. 497, 534 (2007)).

9. EPA Mandatory Greenhouse Gas Reporting, 40 C.F.R. § 98.2(a) (2011).

10. *Greenhouse Gas Reporting Program*, U.S. ENVTL. PROT. AGENCY, http://www.epa.gov/climatechange/emissions/ghgrulemaking.html (last visited Nov. 1, 2011) ("The purpose of the rule is to collect accurate and timely GHG data to inform future policy decisions.").

11. *Id.* (noting that parties who emit *direct* source categories are covered by part 98).

12. *See infra* note 29 and accompanying text.

13. *See* Intergovernmental Panel on Climate Change [IPCC] Plenary XXVII, Valencia, Spain, Nov. 12-17, 2007, *Climate Change 2007: Synthesis Report (AR4)*, 36, http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf [hereinafter IPCC, *2007 Report*].

14. *Id.* at 36-37.

15. ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY 1137 (6th ed. 2009).

16. *Id.* at 1136.

17. As indirect or Scope 2 users of carbon emissions, the Internet companies do not create emissions at their source, but instead consume energy created by the power companies. *See supra* text accompanying notes 6-8; *see also infra* Part I.C.3.

face increasing pressure to reveal their total emissions, particularly by environmental "watchdogs," such as Greenpeace.[18] An article in *Environmental Law*'s Symposium Issue calls electricity generation the "proverbial elephant in the room" of carbon policy discussions.[19] The article states that "[i]n 2008, electricity generation alone produced more greenhouse gas emissions than the entire transportation and agriculture sectors combined"—roughly 34 percent of all US emissions.[20]

Although Internet companies apparently consume substantial amounts of electricity,[21] it has been difficult for policymakers to quantify exactly how much energy such companies use.[22] In an unprecedented move, Google recently publicized its emissions information on its website, stating that in 2010 it generated a total of 1.46 million metric tons of carbon dioxide, an amount that is roughly equivalent to the total carbon footprint created by activities attributable to the United Nations[23], or slightly higher than those emitted by the country of Laos.[24] Meanwhile, other Internet companies state they will not release the numerical value of their total carbon emissions, citing "competitive reasons."[25]

In response to public concern about carbon emissions and their contribution to global warming,[26] Google, Yahoo!, and other Internet companies have announced voluntary "green policies."[27] Google and

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18. Oliver M. Bayani, *Internet Companies Warned of Day of Reckoning in Carbon Disclosure*, ECOSEED (Sept. 13, 2011), http://www.ecoseed.org/energy-efficiency-blog/article/17-energy-efficiency/11221.

19. Teresa B. Clemmer, *Staving Off the Climate Crisis: The Sectoral Approach Under the Clean Air Act*, 40 ENVTL. L. 1125, 1148 (2010).

20. *Id.* at 1148-49.

21. *See* Manek Dubash, *Energy Bill for Data Centres Hits the Roof*, TECHWORLD (Feb. 15, 2007), http://news.techworld.com/operating-systems/8044/energy-bill-for-data-centres-hits-the-roof.

22. COOK & VAN HORN, *supra* note 2, at 7 (giving letter grades based on an Internet company's environmental attributes, including a category for transparency or lack thereof).

23. A recent report states that in 2009, activities attributable to the United Nations were collectively responsible for 1.7 million tons of greenhouse gases. *UN Unveils Report on Size and Scale of its Carbon Footprint*, UN NEWS CENTRE (Apr. 1, 2011), http://www.un.org/apps/news/story.asp?NewsID=37972.

24. Tim Albinson, *Google Releases its Carbon Footprint Information*, 2SUSTAIN (Sept. 12, 2011), http://2sustain.com/2011/09/google-releases-its-carbon-footprint-information.html.

25. *See, e.g.*, *CDP 2011 Investor CDP 2011 Information Request: Yahoo! Inc.*, CARBON DISCLOSURE PROJECT, § 10.3, https://www.cdproject.net/Sites/2011/05/20905/Investor%20CDP%202011/Pages/DisclosureView.aspx [hereinafter *Yahoo! Information Request*].

26. *Global Warming*, N.Y. TIMES, http://topics.nytimes.com/top/news/science/topics/globalwarming/index.html (last updated Sept. 30, 2011).

27. *See, e.g.*, *How GOOD Grows: Climate & Energy*, YAHOO!, http://forgood.yahoo.com/yahoo!-hgg-climate-&-energy.html (last visited Nov. 2, 2011); *Our Energy-Saving Data Centers*, GOOGLE, http://www.google.com/corporate/green/datacenters (last visited Jan. 24, 2011).

Yahoo! plan to become "carbon neutral"—a state in which they will cancel out any negative effects from their own emissions by reducing the world's carbon by an equivalent amount—through the use of carbon offsets and clean energy technology.[28] Google emphasizes that this green policy is completely voluntary; no laws or regulations require Google to submit its total carbon emissions to any regulatory body because it does not emit a large amount of direct (Scope 1) emissions.[29]

Non-regulation of indirect emissions from Internet companies is problematic for several reasons. On a basic level, policymakers need information to make policy.[30] Currently, they do not have access to information regarding many Internet companies' respective carbon footprints.[31] Further, even though Internet companies do not produce the carbon emissions they consume, as bulk consumers they are in a better position to control or justify their own emissions than the power company that produces them.[32] Finally, claiming to be carbon neutral without verification from a regulatory agency or third party may give companies an unjustified competitive advantage: Studies show that a company's green policy influences consumer buying habits.[33]

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28. Josie Garthwaite, *Google vs. Yahoo: The Changing Face of "Carbon Neutral"*, GIGAOM (July 9, 2009, 9:00 PM), http://gigaom.com/cleantech/google-vs-yahoo-the-changing-face-of-carbon-neutral [hereinafter Garthwaite, *Changing Face*]. The term "carbon offsets" refers to the "credits that cancel out the purchaser's greenhouse gas emissions by supposedly triggering actions and projects that prevent such pollution elsewhere." *Id.* When this Note refers to cleaner energy technology, it is referring to technology that would make the data centers more efficient, thus using less energy. *Id.*

29. *CDP 2011 Investor CDP 2011 Information Request: Google Inc.*, CARBON DISCLOSURE PROJECT, § 5.1(a), https://www.cdproject.net/Sites/2011/16/7616/Investor%20CDP%202011/Pages/DisclosureView.aspx [hereinafter *Google Information Request*]. Google notes in its responses that it is not now implicated by climate change regulation because "Google has very few direct emissions." *Id.*

30. *See* Joe Loper & Sara Parr, *Energy Efficiency in Data Centers: A New Policy Frontier*, ALLIANCE TO SAVE ENERGY 15-16 (Jan. 2007), *available at* http://files.harc.edu/Sites/GulfCoastCHP/Publications/EnergyEfficiencyDataCenters.pdf ("[W]idely accepted energy performance metrics . . . will provide the groundwork for other policies that will promote the development and purchase of energy efficient servers including, for example, government procurement policies and financial incentives.").

31. *See* COOK & VAN HORN, *supra* note 2, at 4.

32. Internet companies are "bulk consumers" in that they spend tremendous amounts of money on electricity. *See, e.g.*, Sven Grundberg & Niclas Rolander, *For Data Center, Google Goes for the Cold*, WALL ST. J., Sept. 12, 2011, http://online.wsj.com/article/SB10001424053111904836104576560551005570810.html (noting Google will purchase an amount of electricity equivalent to 200,000 average American homes). For example, Finnish journalists note that after the expense of buying a new data center in Finland, Google's single largest cost will be electricity. *Id.* This Note thus concludes that even without further regulation, the Internet companies have a clear incentive to reduce their electricity use.

33. Michael R. Siebecker, *Trust & Transparency: Promoting Efficient Corporate Disclosure Through Fiduciary-Based Disclosure*, 87 WASH. U. L. REV. 115, 123 (2009).

Individual consumers may make environmentally responsible choices with accurate and complete information.[34]

This Note will address the problems of Internet companies' nondisclosures of their carbon emissions and suggest the best policy for reducing their indirect emissions. Part I will provide a brief background of carbon regulation at the federal and state levels, and will discuss how Internet companies fit into the current regulatory landscape. Part II will discuss various problems caused by the current non-regulation, and the relative strengths and weaknesses of various regulatory options. Part III will propose a solution: A reporting requirement that will publicize users of large-scale, Scope 2 emissions in order to (1) incentivize companies to adopt better, more transparent energy technology and (2) effect change at the individual consumer level. The conclusion will note how important this information is for future—potentially more aggressive—carbon regulation.

I. BACKGROUND OF CLIMATE CHANGE AND INTERNET COMPANIES

The debate over the extent and causes of climate change and the "greenhouse effect" is far from settled, although a large segment of the scientific community has agreed that human energy consumption will negatively affect climate change.[35] The greenhouse effect explains how carbon, emitted as a result of human activity, such as burning fossil fuels in a factory, expends energy into the earth's atmosphere and remains there.[36] Although the debate about global warming continues, state and federal legislators are working to draft comprehensive climate-change legislation.[37] Today, the EPA's reporting rule—which requires organizations that directly emit over 25,000 tons of carbon per year or fall into one of thirty source categories to disclose the exact amount of their emissions—accounts for large-scale, direct emissions.[38] Internet companies escape this reporting requirement because, although they consume a significant amount of carbon, their emissions remain indirect.[39] Furthermore, many Internet companies decline to self-report total emissions, citing

34. Thomas Dietz et al., *Household Actions Can Provide a Behavioral Wedge to Rapidly Reduce US Carbon Emissions*, 106 PROC. NAT'L ACAD. SCI. U.S. 18452, 18454-55 (2009) (indicating that consumers made more environmentally-friendly choices when given information about the environmental impact and price breakdown of their heating practices).

35. *See supra* notes 14-16 and accompanying text.

36. PERCIVAL ET AL., *supra* note 15, at 1136.

37. *See infra* Part II.B.

38. *See* EPA Mandatory Greenhouse Gas Reporting, 40 C.F.R. § 98.2 (2011).

39. *See supra* text accompanying notes 5-14.

"competitive reasons."[40] As a result, neither policymakers nor the public know much about Internet companies' total carbon footprint.[41]

A. Global Warming and the "Greenhouse Effect"

The policy debate over the greenhouse effect has shifted in recent years, with politicians on both sides of the aisle acknowledging a potential problem.[42] However, the extent of the damage that could result from global warming is still debated in scholarly and political circles.[43]

The premise of the greenhouse effect theory is that the atmospheric accumulation of GHGs has an effect roughly analogous to that of glass in a greenhouse; the GHGs act as a roof in a greenhouse, allowing visible light to pass through the atmosphere.[44] The heat is trapped, and re-transmitted to the earth in the form of infrared rays.[45] The concentration of GHGs in the earth's atmosphere has climbed dramatically in the past forty years,[46] and there is strong evidence that this increase is attributable to human behavior, for example, from the use of energy when people burn fossil fuels.[47] In its 2001 Report, the Intergovernmental Panel on Climate Change (IPCC) stated in its "robust"[48] findings, that reduction or mitigation of these greenhouse gases will "lessen the pressures on natural and human systems from climate change."[49] Further findings indicate that without mitigation, climate change will lead to exacerbation in storm

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40. *See Yahoo! Information Request*, *supra* note 25.

41. *See infra* Part I.C.

42. *See* Dana Milbank, *Kerry and Gingrich Hugging Trees—and (Almost) Each Other*, WASH. POST, Apr. 11, 2007, http://www.washingtonpost.com/wp-dyn/content/article/2007/04/10/AR2007041001457.html. Milbank quotes former Speaker of the House and current Republican presidential candidate Newt Gingrich as admitting that global warming is real, that humans have contributed to it, and that it is something that should be "actively" addressed. *Id.* at 1. Democrat John Kerry responded enthusiastically, calling Gingrich's statement "very important." *Id.* at 1.

43. *See, e.g.*, Phyllis Schlafly, *Time to Freeze Global Warming*, CAN. FREE PRESS (Dec. 17, 2010), http://www.canadafreepress.com/index.php/article/31195.

44. PERCIVAL ET AL., *supra* note 15 at 1136 (noting that GHGs include carbon dioxide, methane, nitrous oxides, and other chemicals).

45. *Id.*

46. *Id.*

47. For a more complete summary concerning the causes and expected results of climate change, see IPCC, *Climate Change 2001: Synthesis Report* (2001) [hereinafter IPCC, *2001 Report*], *available at* http://www.ipcc.ch/pdf/climate-changes-2001/synthesis-spm/synthesis-spm-en.pdf.

48. IPCC, *2007 Report*, *supra* note 13, at 72 (defining a robust finding as "one that holds under a variety of approaches, methods, models and assumptions, and is expected to be relatively unaffected by uncertainties").

49. IPCC, *2001 Report*, *supra* note 47, at 32.

systems, loss in various sensitive ecosystems, and potential increase in drought.[50] The IPCC notes that developing countries will bear the worst of these problems.[51]

Although there is still disagreement over the extent and causes of climate change,[52] this Note will assume, in accord with a strong consensus in the scientific community, that the release of carbon emissions accelerates climate change, thereby damaging the planet.[53]

The theory of supply and demand explains Internet companies' contributions to the release of GHG. These companies consume large amounts of power on a routine basis, for example, when using their servers to run searches for users.[54] In turn, the power companies directly emit large amounts of greenhouse gases so that they can produce this power to sell to Internet companies.

Environmental groups and authors of articles on the subject often single Google out for criticism, largely because it is the most popular search engine[55] and thus the most visible. The authors of the *London Times* article that first speculated on Google's carbon footprint reasoned that because Google is the most popular search engine,[56] it must conduct the most searches (using dual search engines to produce famously speedy results) and consequently must consume more electricity than other search engines.[57] Internet companies are secretive about their total emissions, so until Google produced its own numbers, it was difficult for outside parties to verify the company's actual carbon footprint.[58] However, the suggestion that Google consumes the most electricity simply because it is the most popular search engine overlooks the fact that even if Google fires up its servers more often than other Internet companies, it may use less energy if its servers are more efficient. Further, Google takes many environmental

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50. IPCC, *2007 Report*, *supra* note 13, at 72.

51. *Id.* at 65, 72.

52. *Id.* at 72-73.

53. *Id.* at 72.

54. *See, e.g.*, Clemmer, *supra* note 19 (noting how much energy power plants use); *see also* Grundberg & Rolander, *supra* note 32 (noting that Google used the same amount of energy as 200,000 American Households).

55. Sara Forden, *FTC's Timothy Wu Says Dominant Internet Firms Should Not Add Monopolies*, BLOOMBERG, (Apr. 21, 2011), http://www.bloomberg.com/news/2011-04-21/ftc-s-wu-says-dominant-Internet-companies-can-t-have-multiple-monopolies.html.

56. Ross Shannon, *Search Engines* , HTML SOURCE, http://www.yourhtmlsource.com/promotion/searchengines.html (last updated Apr. 23, 2010).

57. *See* Leake & Woods, *supra* note 1 (quoting Harvard physicist Alex Wissner-Gross: "Google operates huge data centres around the world that consume a great deal of power," and noting that Google search requests are processed by several servers competing against one another).

58. *See* COOK & VAN HORN, *supra* note 2, at 32 (giving Google an "F" in transparency in April 2011, before Google released its own numbers in September 2011).

initiatives that the other companies do not.[59] Subsequently, this Note often references Google because there is more information available about Google than any other Internet company; this is not a suggestion that Google uses energy less efficiently than other Internet companies.

B. Current GHG Regulation

Today's regulatory landscape contains carbon legislation and regulations at almost every governmental level. At the federal agency level, the landmark Supreme Court case *Massachusetts v. EPA* recognized that the EPA has the authority to regulate GHG emissions under the CAA if it finds that GHGs endanger the environment.[60] The EPA has exercised this authority by requiring companies that emit large-scale, Scope 1 emissions to report their total emissions.[61] Additionally, state and federal legislators have worked to create climate-change legislation.[62] While these efforts have had varying success at the state level, Congress has not enacted a comprehensive federal bill directed at climate-change regulation.[63]

1. GHG Regulation after *Massachusetts v. EPA*

The CAA authorizes the EPA to regulate "the emission of any air pollutant . . . which in [the EPA administrator's] judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare."[64] An "air pollutant" includes any "air pollution agent or combination of such agents, including any physical, chemical, biological, radioactive . . . substance or matter which is emitted into or otherwise enters the ambient air."[65] The statutory definition for "welfare" is broad, including *inter alia*, effects

59. *See* Tiffany Hsu, *Google Invests $55 Million in Mojave Desert Wind Farm*, L.A. TIMES, May 25, 2011, http://articles.latimes.com/2011/may/25/business/la-fi-wind-power-20110525.

60. Massachusetts v. EPA, 549 U.S. 497, 532 (2007) (holding the "EPA has the statutory authority [under the Clean Air Act] to regulate the emission of such gases from new motor vehicles").

61. *See infra* note 75 and accompanying text.

62. *See infra* notes 90-96 and accompanying text (discussing current and potential climate-change legislation at the state and federal levels).

63. *See infra* Part I.B.2.

64. 42 U.S.C. § 7521(a)(1) (2006).

65. *Id.* § 7602 (g).

on climate, the physical environment, and the economic welfare of citizens.[66]

In *Massachusetts v. EPA*, the Supreme Court held that because GHGs are pollutants under the CAA,[67] the EPA was compelled to determine whether GHGs endangered public health or welfare.[68] The agency concluded "that greenhouse gases in the atmosphere endanger both the public health and the environment for current and future generations," and that the "combined emissions" of new source vehicles contribute to the buildup of GHGs in the climate, therefore adding to the climate problem.[69] Thus, as air pollutants that endanger public health or welfare, GHGs now meet the statutory requirements of the CAA, and the EPA has the statutory authority to regulate GHG emissions.[70]

2. Current and Potential Federal Regulations for Stationary Sources: Greenhouse Gas Reporting Program

The EPA currently requires disclosure of only large scale, direct (Scope 1) emissions under its Greenhouse Gas Reporting program.[71] This program requires "[s]uppliers of fossil fuels or industrial GHGs, manufacturers or [sic] vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG" emissions, to submit annual reports to the EPA.[72] The EPA cites the CAA as the authority behind the reporting regulation.[73] After *Massachusetts v. EPA*,[74] the agency announced in a proposed rule that

66. *Id.* § 7602(h) ("[E]ffects on welfare includes . . . effects on soils, waters, crops, vegetation, manmade materials, animals, wildlife, weather, visibility, and climate, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being, whether caused by transformation, conversion, or combination with other air pollutants.").

67. Massachusetts v. EPA, 549 U.S. 497, 532 (2007).

68. *Id.* at 534; *see also* Nathan Richardson et al., *Greenhouse Gas Regulation Under the Clean Air Act: Structure, Effects, and Implications of a Knowable Pathway*, 41 ENVTL L. REP. 10098, 10100 (2011).

69. *EPA's Endangerment Finding*, U.S. Envtl. Prot. Agency, http://www.epa.gov/climatechange/endangerment/downloads/EndangermentFinding_LegalBasis.pdf.

70. *Id.*

71. *See* EPA Mandatory Greenhouse Gas Reporting, 40 C.F.R. § 98.1(a) (2011).

72. *Mandatory Green House Gas (GHG) Reporting Rule Requirements*, ASSOCIATES ENVTL., 1 http://www.associatesenvironmental.com/Greenhouse_Gas_EPA_web.pdf (last visited Nov. 1, 2011).

73. 40 C.F.R. § 98.1 (citing as authority the Clean Air Act, 42 U.S.C. §§ 7401-7671 (2006)).

74. *See supra* notes 67-70 and accompanying text.

the CAA provided it broad authority to implement the reporting requirement.[75]

The information that companies submit is "potentially subject to public availability."[76] However, in response to complaints, the EPA is now considering whether publicizing the emissions in the notice and comment period will harm business interests.[77] In its interim final rule, the EPA acknowledged that the CAA dictates that emissions data are not to be afforded formal, confidential protections, but, ultimately cited the need for further review.[78] Although the deadline for reporting was originally March 2011, the EPA has since pushed it back to March 2013, and 2015, for certain companies.[79]

Beyond the reporting requirement, it appears that the EPA could enact further, more aggressive climate-change legislation; however, further regulation under the authority of the CAA may be less than ideal.[80] For example, pursuant to the CAA, the EPA already has programs in place to set National Ambient Air Quality Standards (NAAQS) for each of its "criteria" pollutants.[81] These standards are both technology-based and effects-based: Under the NAAQS program, the EPA can dictate a minimum quality for technology use in affected areas as well as a maximum amount of pollutant allowed in a geographical area.[82] Regulating GHGs solely through the CAA can be problematic, however, because of the unique, physical boundary-crossing aspect of GHG emissions: Global warming is a global issue caused by "GHG emissions without regard for where they originate."[83] Further climate-change legislation should address these trans-boundary issues and the CAA may be too rigid to do so.[84]

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75. Mandatory Reporting of Greenhouse Gases: Injection and Geologic Sequestration of Carbon Dioxide, 75 Fed Reg. 18,576, 18,580 (Apr. 12, 2010) (to be codified at 40 C.F.R. pt. 98) (providing that the CAA allows the Administrator to "require emissions sources, persons subject to the CAA, or persons whom the Administrator believes may have necessary information to monitor and report emissions and provide such other information as the Administrator requests for the purposes of carrying out the provisions in the CAA").

76. *Confidential Business Information*, U.S. ENVTL. PROT. AGENCY, http://www.epa.gov/climatechange/emissions/CBI.html (last visited Nov. 17, 2011).

77. *Id.*

78. Interim Final Regulation Deferring the Reporting Date for Certain Data Elements Required Under the Mandatory Reporting of Greenhouse Gases Rule, 75 Fed. Reg. 81,338, 81,339 (Dec. 27, 2010) (to be codified at 40 C.F.R. pt. 98).

79. *See Confidential Business Information*, *supra* note 76.

80. *See infra* note 83.

81. *See* PERCIVAL ET AL., *supra* note 15, at 500.

82. For a more complete discussion of the Clean Air Act, see *id.* at 698.

83. *Id.* at 516. ("Many people believe that the existing Clean Air Act is ill-suited for regulation of GHG emissions . . . [because] the problem of climate change is global.").

84. *Id.*

At the federal level, the Obama administration has expressed interest in a bill that will set a ceiling for US GHG emissions; a goal he may attempt to meet with a cap-and-trade scheme.[85] This type of legislation would set a limit on the amount of emissions a company can exude, but would also allow a company that wants to emit above the limit to trade for the right to do so with a company that emits below the limit.[86] In this way, the total amount of emissions in the environment stays constant, and companies that have larger or smaller emissions can find a workable limit.[87] Congress has proposed and rejected various cap-and-trade bills; the Waxman-Markey Bill, a high profile climate-change bill, passed in the House but expired before the Senate voted on it.[88] While other environmental activists have suggested other schemes, such as a carbon tax,[89] there is no national legislation designed to control Internet companies' GHG emissions.

3. State and Private Regulations Managing GHG Emissions

Members of the Climate Registry, a nonprofit organization that operates a voluntary carbon disclosure registry in North America, have described the relationship between state regulations and the new EPA requirements as a "patchwork."[90] Some states, including Massachusetts, Connecticut, and New Hampshire, have stepped in where the federal government has not, establishing mandatory carbon reporting requirements such as those imposed under the Regional Greenhouse Gas Initiative Program.[91] However, like the EPA's

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85. Mark Peters, *White House Seeks Bill on Climate by December*, WALL ST. J., Apr. 14, 2009, at A3.

86. *See* PERCIVAL ET AL., *supra* note 15, at 604.

87. *Id.* at 603-04. JONATHAN L. RAMSEUR & LARRY PARKER, CONG. RESEARCH SERV., R40242, CARBON TAX AND GREENHOUSE GAS CONTROL: OPTIONS AND CONSIDERATIONS FOR CONGRESS (2009), *available at* http://www.fas.org/sgp/crs/misc/R40242.pdf (discussing policy choices and tools available for addressing greenhouse gas emissions).

88. John M. Broder, *'Cap and Trade' Loses its Standing as Energy Policy of Choice*, N.Y. TIMES, Mar. 25, 2010, http://www.nytimes.com/2010/03/26/science/earth/26climate.html. For some, the defeat of the Waxman-Markey Bill, American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. (2009), was damaging to the cause of cap-and-trade in general. *See id.*

89. *See* RAMSEUR & PARKER, *supra* note 87 (discussing policy choices and tools available for addressing greenhouse gas emissions).

90. Denise Sheehan & Alex Carr, *The Future of GHG Reporting: Patchwork or Tapestry?*, CLIMATE REGISTRY, 12 (Oct. 2010), http://www.theclimateregistry.org/downloads/2010/10/sheehan.pdf.

91. Connecticut, Massachusetts, and New Hampshire are all members of the Regional Greenhouse Gas Initiative's mandatory cap-and-trade program. *RGGI, Inc.*, REGIONAL GREENHOUSE GAS INITIATIVE, http://rggi.org/rggi (last visited Nov. 17, 2011). These states have enacted their own reporting regimes, *see* CONN. AGENCIES REGS. § 22a-174-31 (2011); 310 MASS. CODE REGS. § 7.71 (2010); N.H. CODE ADMIN. R. ANN. ENV-A 900-12 (2010), and are all members

reporting program, the Regional Greenhouse Gas Initiative only requires the reporting of Scope 1 emissions.[92]

Private reporting regimes such as the Carbon Disclosure Project (CDP)[93] publish both Scope 1 and 2 emissions;[94] however, these are voluntary requirements and therefore may not be comprehensive.[95] For example, Yahoo! responded to the CDP's questionnaires, but removed the total emissions used by their data centers to avoid revealing trade secrets, possibly concerned that a competitor could gain competitive information from their infrastructure.[96] Microsoft has not submitted answers to the detailed CDP.

C. How Much Carbon the Internet Companies Use: An Estimate

In addition to the authors of the *London Times* article who speculated on Google's carbon footprint, the EPA has also had difficulty determining the Internet companies' carbon footprints.[97] In April 2011, Greenpeace, a nonprofit organization that works, *inter alia*, to create a global solution that will protect the environment, released a report giving several Internet companies a letter grade in various categories, including "transparency."[98] Before announcing its numbers in September 2011, Google received an "F."[99] Internet

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of the Regional Greenhouse Gas Initiative's mandatory cap-and-trade program. *RGGI, Inc., supra.*

92. Michael P. Vandenbergh & Mark A. Cohen, *Climate Change Governance: Boundaries and Leakage*, 18 N.Y.U. ENVTL. L.J. 221, 250 (2010).

93. The Carbon Disclosure Project is a nonprofit organization that operates a carbon reporting registry. *Overview*, CARBON DISCLOSURE PROJECT, https://www.cdproject.net/en-US/WhatWeDo/Pages/overview.aspx (last visited Nov. 16, 2011). Participants include both national and international organizations. *Id.* CDP receives funding from various foundations as well as several governments, including those of the UK, the US, Sweden, France, Holland and Australia, as well as from corporate sponsorships, CDP member packages, and global partnerships. *Id.*

94. The Carbon Disclosure Project accepts, publishes, and factors data for a company's Scope 1, 2, and 3 emissions into its score report. *Quick Facts*, CARBON DISCLOSURE PROJECT, https://www.cdproject.net/CDPResults/67_329_168_CDP6%20Quick%20Facts.pdf (last visited December 9, 2011).

95. *See* Will Nichols, *Government Urged Again to Deliver Mandatory Emissions Reporting*, BUS. GREEN (July 5, 2011), http://www.businessgreen.com/bg/news/2084015/government-urgered-deliver-mandatory-emissions-reporting (discussing carbon reporting in the United Kingdom).

96. *See supra* note 25 and accompanying text.

97. EPA, ENERGY STAR PROGRAM, REPORT TO CONGRESS ON SERVER AND DATA CENTER ENERGY EFFICIENCY: PUBLIC LAW 109-431 7(Aug. 2, 2007) [hereinafter ENERGY STAR, REPORT TO CONGRESS], *available at* http://www.energystar.gov/ia/partners/prod_development/downloads/EPA_Datacenter_Report_Congress_Final1.pdf

98. COOK & VAN HORN, *supra* note 2.

99. *Id.*

companies cite "competitive reasons" for failing to disclose their total carbon emissions, without elaborating further on how their trade secrets would be compromised by disclosure.[100] Many Internet companies have posted voluntary "green" policies, in which they claim either to have greatly reduced their carbon footprint or to be carbon neutral.[101]

1. The Numbers from the *London Times* Article

The 2009 *London Times* article suggesting that each Google search uses about seven grams of carbon did not stand up well to criticism: the authors backtracked from their original statement, and acknowledged that external factors would alter the results they reached.[102] Some of the most damning criticism came from Harvard physicist Alexander Wisse-Grosse, who wrote the study on which the *London Times* authors relied to write their article.[103] Wisse-Grosse cast doubt on many of the authors' assertions, specifically that he ever singled out Google.[104] Google responded by declaring that each search only expends 0.2 grams of carbon instead of the 7 grams originally cited.[105] Google published its own accounting of its carbon footprint two years after the *London Times* article was published, suggesting that "the energy used to complete 100 searches is equivalent to using a 30 W laptop for an hour or burning a 60 W light bulb for 28 minutes."[106]

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100. *Yahoo! Information Request*, *supra* note 25.

101. *See* Josie Garthwaite, *Google vs. Yahoo: Two Routes Toward Carbon Neutral*, BLOOMBERG BUSINESSWEEK (July 9, 2009), http://www.businessweek.com/technology/content/jul2009/tc2009079_137943.htm.

102. Leake & Woods, *supra* note 1.

103. *Id.*

104. *See* Renay San Miguel, *Harvard Physicist Sets Record Straight on Internet Carbon Study*, TECHNEWS WORLD (Jan. 12, 2009, 2:42 PM), http://www.technewsworld.com/rsstory/65794.html.

105. Ben Dowell, *Sunday Times Clarifies Figures in Google Carbon Emissions Debate*, THE GUARDIAN, Jan. 16, 2009, http://www.guardian.co.uk/media/2009/jan/16/carbon-sunday-times-google-clarification.

106. Albinson, *supra* note 24.

2. Resistance to Disclosure

Some Internet companies, including Yahoo!, refuse to disclose their carbon emissions because they say this will reveal sensitive information to their competitors.[107] However, they have not elaborated on how this information will aid competitors.[108] In its online "green policy," Microsoft states its commitment to reducing or eliminating its carbon footprint, but does not specify its carbon footprint numbers.[109] While environmentalists have praised Google for disclosing its carbon footprint, some have noted that without access to past years' total emissions as a basis of comparison, there is no way to know whether Google's numerous green initiatives are effective.[110] Further, Google has only released its total emissions.[111] Without additional details, such as the number of servers Google uses, how efficient its equipment is, and the server size, it is still unclear whether it is possible for a third party to check Google's calculations for accuracy.[112]

Further, the data industry is having difficulty providing a truly meaningful comparison between Internet companies, even as each claims to be "green" or the "greenest."[113] Data companies currently use a categorical listing of their Power Usage Effectiveness (PUE), which industry commentators have called "a great step."[114] PUE is a measure of how efficiently a computer data center uses its power or more specifically, how much of the power is used by the computing equipment (in contrast to cooling and other overhead).[115] The ideal PUE is 1.0; that number can serve as a baseline to help make

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107. *Cf. Yahoo! Information Request*, *supra* note 25.

108. *See* Chris Mellor, *Google's Green Credentials Confirmed: An Interview with Google's Director of Energy Strategy*, TECHWORLD (June 27, 2007), http://features.techworld.com/green-it/3494/googles-green-credentials-confirmed (noting that, although Google is partnering with an independent third party to determine its accurate carbon footprint, information will not be revealed because it comprises "key competitive elements of [its] operational infrastructure").

109. *See The Carbon Trust Standard*, MICROSOFT, http://www.microsoft.com/uk/environment/reducing-our-carbon-footprint.aspx (last visited Nov. 1, 2011).

110. Raz Godelnik, *Google Releases Details on its Carbon Footprint*, TRIPLE PUNDIT (Sept. 13, 2011), http://www.triplepundit.com/2011/09/google-finally-released-details-carbon-footprint-reducing.

111. *See id.*

112. *See infra* text accompanying notes 113-122.

113. *See The Carbon Trust Standard*, *supra* note 109 ("In the face of so much talk around 'green' we've been focused on quietly getting on with actually being green.").

114. Rich Miller, *Green Grid: PUE Uptake a 'Great First Step'*, DATA CENTER KNOWLEDGE (Dec. 17, 2008), http:www.datacenterknowledge.com/archives/2008/12/17/green-grid-pue-uptake-a-great-first-step.

115. *Id.*

comparisons among companies.[116] For example, Google is explicit about the data included in the PUE.[117] Google's current PUE ranges between a 1.14 and 1.11.[118] Theoretically, another company computing the same way could provide an effective comparison in terms of relative efficiency.[119]

However, there are clear limitations to a PUE-based analysis. Some commentators challenge the assumption that the PUE accurately measures the efficiency of data equipment at all.[120] Additionally, some companies only publish their final PUE without publishing the individual numbers they used to arrive at their total, for example, how many servers they use.[121] This may be indicative of how efficient the equipment is, but does not reveal how much carbon a search produces. Therefore, even with the PUE, it will still be difficult for policymakers to make an aggregate analysis of Internet companies' total carbon footprint. The Google example illustrates this problem: The company uses multiple competing servers to produce an answer to one search query, so it may have more efficient equipment but still produce twice as many carbon emissions.[122] Ultimately, the PUE is a difficult substitute for publicly available calculations because a third party cannot check these numbers—nor is there an accessible public format that explains Internet search engine usage and resultant carbon emissions.

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116. *See id.; see also Power Usage Effectiveness (PUE)*, DIGITAL REALTY TR., http://www.digitalrealtytrust.com/pue-efficiency.aspx (last visited Nov. 1, 2011).

117. *Data Center Efficiency*, GOOGLE, http://www.google.com/about/datacenters/inside/efficiency/power-usage.html (last visited Nov. 16, 2011) (noting that their calculation of PUE is limited to "the servers, storage and networking equipment when measuring IT equipment power").

118. *Id.*

119. *See* Miller, *supra* note 114.

120. Indus. Perspectives, *The PUE is Dead: The Case for Performance Per Watt*, DATA CENTER KNOWLEDGE (Nov. 15, 2011), http://www.datacenterknowledge.com/archives/2011/11/15/pue-is-dead-the-case-for-performance-per-watt (arguing that the PUE only "measures how much of the energy entering a data center facility is used to power the computing devices within, versus the amount used for cooling and overhead of the facility" instead of the overall efficiency of the data center equipment).

121. *See* Miller, *supra* note 114 (noting that some questioned Google's PUE math while others believed long-term PUE numbers would be more helpful than "one time 'snapshots'").

122. *See* Leake & Woods, *supra* note 1 (noting that a Google user's search request does not go to just one server, but goes to several competing servers).

3. Koomey Study and EPA Findings

Professor Jon Koomey, a notable academic in the field of electrical energy, provides some relevant information regarding the vast amount of electricity that data centers are using.[123] He notes that because the number of servers in the United States and around the world has increased, aggregate electricity use doubled from 2000 to 2005.[124] He estimates that servers comprised 0.6 percent of total US electricity consumption in 2005.[125] With cooling and auxiliary infrastructure equipment, that number increases to 1.2 percent.[126] Professor Koomey has recently said that he does not expect rates to continue to rise at the same pace.[127]

In its 2007 report to Congress analyzing data server efficiency, the EPA concluded that in the previous year, both public and privately operated US data centers' energy use was equivalent to the amount of energy that 5.8 million US households used during the same period.[128] The EPA noted that its findings were based on "the best publicly available data" because it experienced some difficulty in finding readily apparent data on the servers; without further legislation, or potential EPA action, the EPA only has access to the same data as the

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123. JONATHAN G. KOOMEY, ESTIMATING TOTAL POWER CONSUMPTION BY SERVERS IN THE U.S. AND THE WORLD i (Feb. 15, 2007), *available at* http://blogs.business2.com/greenwombat/files/serverpowerusecomplete-v3.pdf.

124. *Id.*

125. *Id.*

126. *Id.* For more information on why 1.2 percent—a relatively small percentage—is large enough to be worth regulating, see Kevin Stack & Michael Vandenbergh, *The One Percent Problem*, 111 COLUM. L. REV. 1385 (2011). The authors note that the "one percent problem" arises where multiple parties "commonly justify exemption from regulation by claiming to be only one percent of a problem." *Id.* at 1386. This exemption becomes a problem in the context of climate change, where many parties are small-scale contributors. *Id.* at 1388. Professors Stack and Vandenbergh further argue that it is easy for industry to make these arguments in the context of climate change, and "[i]t is nearly impossible to reach established emissions reduction goals without addressing the vast number of sources, sectors, and countries that can frame their emissions as just one percent, or far below one percent, of the problem." *Id.* at 1443. This Note operates on the assumption that ignoring the many, relatively small contributors—that in the aggregate have a large impact on climate change—will ultimately impede progress toward the goal of reducing carbon emissions.

127. Matt Stansberry, *Jon Koomey: Stopping the Runaway Train of Server Energy Usage*, SEARCHDATACENTER (Aug. 12, 2010), http://searchdatacenter.techtarget.com/news/1518354/Jon-Koomey-Stopping-the-runaway-train-of-server-energy-usage. In an interview, Professor Koomey has suggested that he is just after information. *Id.* The purpose of this Note is not to criticize electronic server data, but to show that emissions disclosure should be required because it will prevent false advertising and promote efficiency. *See id.* Ultimately, as Professor Koomey says, it is still a more efficient use of energy to push around electronic molecules instead of paper molecules; the issue here is that the public does not know how much energy is being consumed by these Internet giants, and the numbers appear to be staggeringly high. *Id.*

128. ENERGY STAR, REPORT TO CONGRESS, *supra* note 97, at 25.

public.[129] The report included recommendations mandating more publicly available information to provide a better basis of comparison among various data servers.[130]

4. The Internet Companies' Approach to Energy Management

Although Internet companies' carbon emissions are not regulated under federal or state law, most large Internet companies have adopted their own "green" policies.[131] These companies are likely adopting cleaner energy policies voluntarily for several reasons: social responsibility, public perception as it relates to consumer choice, the cost of electricity, and the anticipation of stricter energy regulations.[132] Because there is a wide range of potential approaches to regulation, some companies are taking a proactive approach.[133]

These companies have devised a system to measure their own carbon efficiency, claiming that third parties check their calculations.[134] Although many companies have not revealed their totals, they must know their own total emissions if they can comment on their emissions reductions or the relative efficiency of their equipment.[135] Today, many Internet companies decline to participate in voluntary cap-and-trade programs.[136] Internet companies do not participate in some of these voluntary reduction programs because without mandatory disclosure, they face little public accountability for their emissions.[137] Without a more transparent system that can engender genuine comparison between the companies' total emissions, it will (1) be difficult for the public to give credit, reflected in consumer

129. *See id.*

130. *Id.* at 14.

131. *See, e.g.*, *Our Footprint*, MICROSOFT, http://www.microsoft.com/environment/our-commitment/our-footprint.aspx (last visited Nov. 18, 2011) (stating Microsoft's goal for 2012 is to reduce carbon emissions per unit of revenue by at least 30 percent as compared with their 2003 levels by using, *inter alia*, more efficient equipment); *Reducing Our Carbon Footprint*, GOOGLE BLOG (May 6, 2009, 3:05 PM), http://googleblog.blogspot.com/2009/05/reducing-our-carbon-footprint.html (noting that Google has been voluntarily carbon neutral since 2007, and remains committed to reducing its footprint through offsets and greater efficiency).

132. *See* Aseem Prakash, *Green Marketing, Public Policy and Managerial Strategies*, 11 BUS. STRATEGY & ENV'T 285, 286-90 (2002), *available at* http://www.greeneconomics.net/GreenMarketing.pdf.

133. *See, e.g.*, *Google Information Request*, *supra* note 29, § 5.1(a). Here, Google states that it does not expect to participate in compliance-market trading. *Id.* However, it notes that "Google does . . . face the risk of increased cost of energy if a price on carbon is applied through legislation such as cap and trade (or other mechanisms such as taxation)." *Id.*

134. *See Reducing Our Carbon Footprint*, *supra* note 131.

135. *See Yahoo! Information Request*, *supra* note 25.

136. *See id.* Yahoo! and Google currently decline to participate in voluntary cap-and-trade schemes. *See id.*; *Google Information Request*, *supra* note 29.

137. *See infra* Part II.A.1.

behavior, for true technological innovations that reduce emissions,[138] and (2) for policymakers to understand the scope of Internet companies' contributions to climate change.[139]

Various legislative options have several notable flaws. Currently, the EPA has not attempted to create a mandatory, publicly accountable registry that would encompass private, indirect emissions.[140] Further, under the CAA, the EPA is having trouble publicizing direct emissions in response to pressures from companies who do not want to submit their information.[141] State and local schemes suffer from a lack of uniformity[142] and large, national companies can easily manipulate these schemes.[143]

For these reasons, this Note will argue that the US Congress is best positioned to enact legislation mandating the publication of accurate and uniform secondary emissions, giving direct authority to the EPA to enact this scheme. This legislation will incentivize Internet companies to present accurate information regarding their relative carbon emissions and to compete to create and utilize the most energy efficient technology.

II. LEGISLATIVE OPTIONS FOR INTERNET COMPANIES IN THE CURRENT REGULATORY LANDSCAPE

Internet companies' lack of transparency regarding total emissions prevents policymakers from learning how much energy Internet companies are indirectly utilizing and prevents the public from making meaningful comparisons to determine which company is the most energy-efficient.[144]

This presents a problem for several reasons. First, without a public registry of comparative energy efficiency, companies will have little incentive to become more energy efficient. Yet the current lack of transparency allows these companies to announce that they are "carbon neutral"[145] or use the "most efficient equipment" by using unclear methods[146] without verification. This could have unfair effects on consumer choice, specifically for those who wish to purchase the

138. *See infra* Part II.A.2.

139. *See infra* Part III.B.

140. *See supra* Part I.B.2.

141. *See infra* note 152 and accompanying text.

142. *See* Sheehan & Carr, *supra* note 90.

143. *See infra* note 214 and accompanying text.

144. *See* ENERGY STAR, REPORT TO CONGRESS, *supra* note 97.

145. Jeffrey Ball, *Green Goal of 'Carbon Neutrality' Hits Limit*, WALL ST. J., Dec. 30, 2008, http://online.wsj.com/article/SB123059880241541259.html.

146. *See infra* part II.A.

most environmentally efficient product on the market.[147] Second, environmentally conscious consumers who modify their personal habits when they have access to accurate energy use information, may also modify their habits when given similar information regarding Internet search.[148] Third, policymakers need to know how much energy these companies use, so that they can craft the most effective and fair climate-change regulation.[149]

An effective option for Internet companies is a publicly accountable, national carbon registry that includes Scope 2 emissions.[150] Any strong regulatory solution will consider the two main factors that dictate emission control policy: (1) the costs and (2) whether regulation will be effective.[151]

Some of the current or suggested approaches are unfeasible, either because they are impractical or because they do not account for the above mentioned factors. For example, although it should expect opposition from Internet companies given the controversy over reporting requirements for companies that directly emit more than 25,000 grams of carbon, the EPA has authority under the CAA to mandate disclosure.[152] Therefore, it is likely that this approach would be similarly cumbersome. State legislation is another possible vehicle to address this issue. Although this has been somewhat effective at the local level, it does not create a comprehensive national climate-change policy because each state takes its own approach.[153] Thus, this method would be ineffective for large corporations, like Google, that have servers in several states and can concentrate their operations in a state with more lax requirements.[154] Finally, federal lawmakers

147. *See infra* Part II.A.2.

148. *See* Dietz et al., *supra* note 34, at 18455 (noting that lifestyle changes, especially those enacted in conduction with a cost incentive, may become attractive options for dealing with climate change).

149. *See* Loper & Parr, *supra* note 30, at 15-16.

150. Scope 3 emissions are also effective and should be included. However, that is beyond the scope of this Note.

151. RAMSEUR & PARKER, *supra* note 87, at 17-19 (noting that while cap-and-trade may be a more effective solution, a carbon tax is less expensive to implement).

152. *Compare* Dina Cappiello, *Largest US Polluters Want EPA to Keep Their Emissions Secret From Public*, COMMON DREAMS (OCT. 28, 2010), http://www.commondreams.org/headline/2010/10/28-3 (discussing resistance to the EPA reporting rule by affected companies who do not want to disclose emissions), *with EPA Announces New GHG Reporting Deadline*, ENVTL. LEADER (Mar. 17, 2011), http://www.environmentalleader.com/2011/03/17/epa-announces-new-ghg-reporting-deadline (noting that EPA's reporting deadline has been pushed back).

153. Sheehan & Carr, *supra* note 90.

154. *See, e.g.*, COOK & VAN HORN, *supra* note 2, at 5 (noting that data center clusters, like those owned by Google, Facebook, and Apple, are cropping up in places like North Carolina and the Midwest, where cheap and dirty coal-powered electricity is abundant); John Markoff & Saul Hansell, *Hiding in Plain Sight, Google Seeks More Power*, N.Y. TIMES (June 14, 2006), http://www.nytimes.com/2006/06/14/technology/14search.html (noting that in 2006, Yahoo!, Microsoft,

typically consider cap-and-trade, and to a lesser extent, a carbon tax, when crafting energy regulation proposals.[155] Although cap-and-trade may be effective in regulating carbon emissions, it is more expensive than a carbon registry, and has had trouble passing in Congress. A carbon registry will not set a cap for total emissions the way a cap-and-trade scheme will, however, it will force Internet companies to be accountable to the public for their emissions. If necessary, lawmakers can use the information from the Registry as a means to enact more aggressive regulation. For these reasons, the Federal Carbon Registry is the strongest solution to the problem posed by Internet companies.

A. Problems Caused by Leaving Internet Companies Unregulated

Without regulation, Internet companies have no incentive to invest in cleaner energy. Compared to an outside organization, Internet companies are in the best position to create and dictate cleaner energy technology because they have to pay for the carbon they use and have unique insight into their own infrastructure and carbon needs. However, without mandated reporting, Internet companies will remain opaque regarding their carbon consumption while continuing to claim carbon efficiency or neutrality.[156] This leaves both policymakers and the public without the information they need to make informed choices. It also raises ethical concerns, especially in light of studies showing that these claims have a measureable effect on consumer choice.[157]

1. Internet Companies are in the Best Position to Invest in Cleaner Energy, and without Regulation they Lack Incentive to Create Cleaner Energy

Failure to regulate Internet companies reduces the companies' incentives to create better, energy-efficient technology. Technology-based standards for regulated industries are common in environmental regulatory regimes.[158] Internet companies can

and Google were building servers in Washington and Oregon, where "cheap electricity" is readily available).

155. PERCIVAL ET AL., *supra* note 15, at 158.

156. *See* Ball, *supra* note 145.

157. *See infra* Part II.A.2.

158. *See, e.g.*, Clean Water Act, 33 U.S.C. §§ 1316-17 (2006) (establishing multiple technology-based effluent limitations); *see also* PERCIVAL ET AL., *supra* note 15, at 638. A typical technology-based standard is usually employed to control pollution at its source, i.e., where pollution is introduced to surface waters, air, or drinking waters. Wendy E. Wagner, *The Triumph of Technology-Based Standards*, 2000 U. ILL. L. REV. 83, 88-89. Generally enacted by

voluntarily use these standards to help create an effective comparison of their relative energy efficiency.

Technology-based standards create a uniform set of expectations for companies that are cost-effective and reasonable.[159] The Clean Water Act is considered a relatively successful example of a technology-based standard because affected waters have been found less polluted since its enactment widely because of its provisions.[160] Global policymakers argue that climate-control policy should encourage the electric industry to develop better technology-based standards to help control carbon emissions.[161]

The rationale for creating a system in which unofficial, industry-wide, and technology-based limits result is that these regulations will incentivize the regulated parties to compete and create efficient energy technology.[162] The government could use a cost-effective PUE to serve as this standard, enabling it to measure the carbon footprints of similarly situated Internet companies. However, this kind of standard could face enormous resistance from affected industries, and without more information it might unfairly disadvantage smaller companies that cannot cut energy costs the same way the larger corporations can. But a public reporting requirement could have the same effect on the industry by forcing Internet companies to self-regulate based on the unofficial norm it would create: They would face internal—and even external—pressure from consumers to catch up with the rest of the industry. The smaller companies would be protected, and the larger companies would not be negatively incentivized to remain at the government standard.

Further, it is logical to assume that Internet companies are easier to incentivize than direct emitters such as power companies because the power companies make money from the sale of electricity whereas Internet companies have to pay for power.[163] Because power

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the EPA, the Agency will begin by researching available and potential technologies that can control pollution in a given industry. *Id.* The EPA will ultimately choose a standard type of technology based on the technology available and the cost-considerations of implementing that technology. *Id.*

159. Wagner, *supra* note 158.

160. William L. Andreen, *Water Quality Today—Has the Clean Air Act Been a Success?*, 55 ALA. L. REV. 537, 592 (2004) ("Together with the funding of thousands of municipal wastewater treatment facilities, the technology-based approach has produced remarkable reductions in both municipal and industrial [water] pollution.").

161. Ziga Zarnic, *European Electricity Market Reforms: Any Signs of Efficiency Improvements?* 4 (Katholieke Universiteit Leuven, LICOS Discussion Paper Series, Discussion Paper 262/2010, May 2010), http://www.econ.kuleuven.be/licos/DP/DP2010/DP262.pdf.

162. *Id.*

163. According to Bill Weihl, head of Google's sustainability efforts, despite Google's substantial energy bill, it does not represent a large portion of Google's overall costs. However, Weihl notes, reduced energy use is good for both the environment and Google's bottom line. Steve

companies make money when Internet companies purchase energy, they will have an incentive to meet the minimum threshold that a technology-forcing standard would create. However, Internet companies will gain financially from more efficient energy use because their energy bills will be lower.[164] Creating new, energy-efficient technology could be expensive, which could discourage initial innovation.[165] However, a cleaner energy policy will reduce larger Internet companies' electricity bills.[166]

2. Ethical Concerns When Internet Companies Claim Carbon Neutrality Where there is No Third Party to Check these Calculations

Lack of transparency raises ethical concerns when Internet companies claim to be carbon neutral without outside third-party verification. In light of SEC guidance suggesting that companies should accurately disclose their risk in the face of climate-change legislation, an inaccurate claim of carbon neutrality is unethical.[167] It is also unfair because: (1) without public accountability, there is no way to verify these companies' claims of carbon neutrality, and (2) these companies' green policies will directly affect consumer choice.[168]

The public cannot verify anything about Internet companies' relative carbon neutrality because there is no way to compare the numbers effectively. The standard industry measurement, PUE, creates a baseline but lacks consistency in how each company defines its total energy output.[169] Further, the relative efficiency of each company's output only tells half of the story because it says nothing

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Hargreaves, *The Internet: One Big Power Suck*, CNN MONEY (May 9, 2011) (discussing internet companies' large electricity usage and bills).

164. *Id.*

165. It is fairly common for an affected industry to argue that implementing stricter environmental standards will be prohibitively expensive. *See* Editorial, *Detroit Turns a Corner*, N.Y. TIMES, Jan. 11, 1998, *available at* http://www.nytimes.com/1998/01/11/opinion/detroit-turns-a-corner.html ("There has always been a big gap between industrial leaders who say they cannot do something, and their engineers who usually figure out a way to do it.").

166. *See id.*; *see also* discussion *supra* Part I.C.2 (arguing that without greater transparency, the Internet companies are not publicly accountable because the public cannot effectively compare the relative efficiency of the companies without an accurate total number of emissions).

167. An inaccurate statement of carbon neutrality would be unethical in light of guidance from the Security and Exchange Commission suggesting that companies should disclose their climate change risks, *See infra* note 192 and accompanying text.

168. Siebecker, *supra* note 33, at 123-24; *see also* Joe Polastre, *Top 5 Myths About Google Data*, ZDNET (Apr. 26, 2010, 12:00 AM), http://www.zdnet.com/news/top-5-myths-about-google-data-centers/417847 (suggesting that the selective information some Internet companies choose to disclose to the public can be misleading).

169. *See supra* notes 113-122 and accompanying text.

about the overall size of the company's carbon footprint.[170] Policymakers need to know the total amount of emissions to determine whether they need to take more aggressive action. According to a study by Professor Koomey, diversity among server types makes comparison difficult for industry outsiders.[171] Finally, because it is unknown how many servers larger Internet companies have,[172] and the PUE only calculates the relative efficiency of the technology, the PUE will not help calculate the total amount of the companies' power outputs: Ten efficient servers may still create more emissions than one inefficient server.[173] Although recent articles suggest that Google and Microsoft may be moving ahead in the PUE rankings,[174] these combined factors make a meaningful comparison difficult.

Internet companies have used two main schemes to reduce their carbon footprints: (1) creating more efficient machines, and (2) utilizing carbon offsets.[175] Companies who bolster their claims to be "voluntarily" carbon neutral through the use of carbon offsets are problematic because of the controversy surrounding this method of carbon reduction.[176] The idea behind carbon offsets is that a company that cannot otherwise reduce its carbon use, purchases carbon "credits"—for example, from an organization working to reduce carbon emissions—which help fund projects that reduce carbon expenditures in an amount that equals the company's extra expenditure.[177] However, the carbon market is largely unregulated, and in the past few years, studies have suggested that some carbon offsets may not offset the corresponding carbon expenditures.[178] Sometimes, companies will buy carbon credits for projects that are never completed, or projects that would have been completed without the

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170. *See* Miller, *supra* note 114.

171. *See* KOOMEY, *supra* note 123.

172. Rich Miller, *Who Has the Most Web Servers?*, DATA CENTER KNOWLEDGE (May 14, 2009), http://www.datacenterknowledge.com/archives/2009/05/14/whos-got-the-most-web-servers (estimating how many servers Google, Yahoo!, and Microsoft have).

173. *See supra* notes 113-122 and accompanying text.

174. *Cf.* Jaymi Heimbuch, *Microsoft to Google: My PUE is Getting Better Than Your PUE*, TREEHUGGER (Oct. 28, 2008), http://www.treehugger.com/clean-technology/microsoft-to-google-my-pue-is-getting-better-than-your-pue.html.

175. *See, e.g.*, Garthwaite, *supra* note 101 (detailing the two approaches Google and Yahoo! have taken to improve their overall carbon footprint: carbon offsets (Google) and more efficient technology (Yahoo!)); sources cited *supra* note 131.

176. *See* Garthwaite, *supra* note 101.

177. Craig Rubens, *The House Duped by Carbon Offsets?*, GIGAOM (Jan. 29, 2008, 5:00 AM), http://gigaom.com/cleantech/the-house-duped-by-carbon-offsets (detailing some of the problems in the carbon offset market, including where additional carbon reduction is thwarted when offset money is used to fund projects that would have happened anyways).

178. *Id.*

carbon expenditures.[179] Years later, Google has had trouble spending the credits it acquired initially,[180] while Yahoo! has given up using carbon offsets to offset its carbon footprint.[181] Private businesses help other companies who want to purchase carbon offsets navigate the carbon-offset field; however, because this field is largely unregulated, the reliability of these private companies is unclear.[182]

Internet companies' unverified claims of neutrality are troubling because evidence has shown that a company's "green" image can influence consumer choice.[183] In a recent study, Professor Michael Siebecker suggests that "many large U.S. companies consider their stance on labor, environmental, and social practices to be the 'next competitive battlefield.'"[184] He further argues that unclear corporate disclosures are problematic "where consumers and investors employ various social, environmental, or ethical screening criteria before purchasing a company's stock or products."[185] Congress, which is obligated to buy the most efficient equipment reasonably available, qualifies as a vulnerable consumer in this context.[186] Relying on PUE might be a "great first step,"[187] but for the reasons listed above, it is insufficient.[188]

Some legal commentators see an additional problem arising from this type of claim in the green energy market. In her Comment, *Trust and the Green Consumer: The Fight for Accountability in Renewable Energy Credits*, Kelly Crandall notes that in the related

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179. *Id.*

180. *Cf.* Ucilia Wang, *Google: Carbon Credit Shopping Ain't Easy*, GREENTECH ENTERPRISE (May 7, 2009), http://www.greentechmedia.com/articles/read/google-carbon-credit-shopping-aint-easy-4545.

181. Garthwaite, *supra* note 101.

182. *See* Lisa Roner, *US Carbon Offsets: Still Unregulated and Unreliable*, CLIMATECHANGECORP (Sept, 6, 2007), http://www.climatechangecorp.com/content.asp?ContentID=4909 (discussing some of the problems in the unregulated carbon market); Rubens, *supra* note 177 (noting that the carbon market is unregulated).

183. *See* Kelly Crandall, Comment, *Trust and the Green Consumer: The Fight for Accountability in Renewable Energy Credits*, 81 U. COLO. L. REV. 893, 919-20 (2010).

184. Siebecker, *supra* note 33, at 127 (quoting Clinton Wilder, *The Next Competitive Battlefield—The Sustainability Movement's 'Triple Bottom Line' Requires IT Execs to Deliver Better Data*, OPTIMIZE, 76 (Aug. 1, 2002)).

185. *Id.* at 117.

186. *See* Loper & Parr, *supra* note 30, at 18 ("The federal government is required by law to purchase energy efficient products unless they are proven to not be cost effective.").

187. Miller, *supra* note 114.

188. *See supra* notes 120-122 and accompanying text (noting that the PUE is not an ideal comparison of equipment efficiency for several reasons, particularly because it is not verified by a third party, may not measure overall efficiency, and can be affected by outside factors that are not always reported).

field of renewable-energy credits,[189] a market that can be manipulated, is created by "[g]rowing environmental consciousness among consumers and weak supervision at the state and federal levels."[190] Crandall concludes that greater supervision and accountability is the only solution to this problem.[191] The Securities and Exchange Commission has also weighed in on this matter, recently issuing guidance clarifying that under existing laws, companies should consider how to appropriately disclose their climate regulation risks.[192]

Finally, without mandatory disclosure, policymakers will not have enough information to help dictate decisions regarding whether emissions should be measured at the Scope 1 or Scope 2 levels for the purposes of climate-change legislation.[193] Additionally, policymakers may remain locked into some of the regulatory alternatives that are mentioned above, such as cap-and-trade, without an accurate estimate of the amount of carbon these companies are emitting.[194] Further, lack of consensus about the extent of climate-change damage hinders regulation.[195] Environmentalists often argue that it is better to regulate to prevent harm before it occurs than to try to remedy potentially irreparable damage after the fact.[196] This stance is difficult to defend because many politicians would prefer to avoid policies that are based on incomplete information, which might offend powerful economic interests.[197] Here, policymakers can avoid this type

189. This Note will analogize renewable energy credits to the use of carbon offsets because renewable energy credits are another way of commoditizing the environmental benefit of renewable energy. Crandall, *supra* note 183, at 895-96. For more information, see *id.* Like carbon offsets, renewable energy credits are purchased by consumers and used to satisfy renewable energy purchasing requirements. *Id.*

190. *Id.* at 957.

191. *Id.* at 957-58.

192. Press Release, Sec. & Exch. Comm'n, SEC Issues Interpretive Guidance on Disclosure Related to Business or Legal Developments Regarding Climate Change (Jan. 27, 2010), http://www.sec.gov/news/press/2010/2010-15.htm; *see* Scott D. Deatherage, *The SEC Enters the Fray on Climate Risk Disclosure*, 25 NAT. RESOURCES & ENV'T 35, 36-38 (2011).

193. *See* Loper & Parr, *supra* note 30, at 15-16 (arguing that policymakers generally need complete information about the issues they confront in order to make strong policy).

194. *See* Joe Romm, *Why did Environmentalists Pursue Cap-and-Trade and was it a Doomed Strategy?* CLIMATE PROGRESS (Apr. 21, 2011, 2:15 PM), http://thinkprogress.org/romm/2011/04/21/207932/cap-and-trade-doomed (arguing that environmentalists pursued cap-and-trade as a strategy when the "obvious alternatives" to cap-and-trade, including a carbon tax, were rejected).

195. *See* PERCIVAL ET AL., *supra* note 15, at 1146.

196. *See id.* at 1146-47.

197. *See id.* at 1146; *see also*, Eugene B. Skolnikoff, *The Policy Gridlock on Global Warming*, 79 FOREIGN POL'Y 77, 78 ("Significantly, discussion of the proposals often neglects the real costs of premature action: the resources denied to other crucial needs and the effects of what might prove to be costly policy errors."). *But see* Dana Nuccitelli, *Monckton Myth #11: Carbon*

of public scrutiny by mandating disclosure of information measuring exactly how much Internet companies are contributing to the climate change problem.

B. Realistic Options for Regulation of Internet Companies

Politicians and policymakers have brought more aggressive climate-change legislation to Congress before, but lawmakers have not reached a consensus regarding the content of this legislation. Political commentators suggest that this gridlock may continue indefinitely.[198] One reason is that Congress generally views global warming along party lines: Republicans are more likely to oppose climate-change legislation, while Democrats are more likely to favor tighter regulations.[199] This makes it harder for Congress to enact legislation. A recent victim of political gridlock was the Waxman-Markey Bill, legislation that would have codified a cap-and-trade[200] scheme of regulation but never passed in the Senate.[201] These partisan views influence the shape of environmental legislation proposals, contributing to the push and pull between strong policy and cost-effective, achievable policy.[202]

As discussed above, there are a variety of possible regulatory "enforcers" that can navigate the disclosure issue created by Internet companies, including (1) agency action (expanding the EPA reporting requirements to include Scope 2 emissions), (2) state legislation, and (3) federal legislation (either in the form of a cap-and-trade or the creation of a uniform, publicly available carbon-use registry).[203] A federal and publicly available carbon registry is the strongest solution because, through the pressures of public accountability, it will incentivize Internet companies to create and use efficient technology,

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Pricing Costs vs. Benefits, SKEPTICAL SCI. (Feb. 14, 2011), http://www.skepticalscience.com/monckton-myth-11-carbon-pricing-costs-vs-benefits.html (arguing that preventing climate change is cheaper than adapting to it when the harm worsens).

198. Eric Pooley, *Why the Climate Bill Failed*, TIME June 9, 2008, http://www.time.com/time/nation/article/0,8599,1812836,00.html.

199. George Monbiot, *Right and Wrong: Why Climate Science Divides People Along Political Lines*, MONBIOT.COM (Aug. 23, 2010), http://www.monbiot.com/archives/2010/08/23/right-and-wrong.

200. *See generally* RAMSEUR & PARKER, *supra* note 87; Kate Sheppard, *Everything You Always Wanted to Know About the Waxman-Markey Energy/Climate Bill—in Bullet Points*, GRIST (June 3, 2009), http://www.grist.org/article/2009-06-03-waxman-markey-bill-breakdown. *See supra* notes 85- 87 and accompanying text for a definition of a cap-and-trade scheme.

201. American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong., *available at* http://www.govtrack.us/congress/bill.xpd?bill=h111-2454 (noting that the bill never became law because the Senate session expired before it passed and it was cleared from the books).

202. RAMSEUR & PARKER, *supra* note 87, at 3-7.

203. *Id.* at 3-7.

it is cost effective, and it will create uniform measurements for policymakers and the public to utilize.

1. Agency Action: Potentially Frustrated by Administrative Requirements under the EPA

Although the EPA could include Scope 2 emissions in its reporting requirements, administrative difficulties, like the Administrative Procedure Act's requirement for a notice-and-comment period, might frustrate its efforts.[204] The largest challenge the EPA will face here is opposition from Internet companies similar to the challenges from affected companies that the agency recently faced in promulgating the GHG Reporting Rules.[205] It is reasonable to expect a similar battle in the notice-and-comment period if the EPA expands its reporting rules to include indirect emissions.[206] This can lead to significant delays in legislating climate-change regulation. A federal carbon registry may take time to enact; however, it would give the agency the unquestioned authority to act and a clearer timetable for doing so.

EPA regulation under the CAA may not be a good match because of the boundary-crossing problems unique to climate-change legislation.[207] The EPA has the authority to regulate "air pollutants" that are anticipated to endanger public health.[208] However, it could be difficult for the EPA to regulate a particular industry based on an effects test when non-Internet companies that emit carbon and affect areas outside of US jurisdictions, determine those effects.[209] Additionally, Internet companies could argue that counting Scope 1 emissions serves one of the CAA's goals, which is to prevent adverse effects on the environment. They could also argue that "double counting" could exceed statutory authority.

Although the EPA may have the authority to implement a climate-change registry without additional legislation, it has largely backed away from a challenge by the companies implicated in the current reporting requirement.[210] And while the EPA will probably serve as the agency that regulates a federal carbon bill, it will be more effective with explicit, federal authority.

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204. *See* Administrative Procedure Act, 5 U.S.C. § 553 (2006).
205. *See supra* notes 71-79 and accompanying text.
206. *See supra* notes 81-83 and accompanying text.
207. *See supra* notes 81-83 and accompanying text.
208. *See* Clean Air Act, 42 U.S.C. §§ 7408, 7411.
209. *See supra* notes 81-83 and accompanying text.
210. *See supra* notes 71-79 and accompanying text.

2. State Legislation: A Fatal Lack of Uniformity

Some states already require accounting of Scope 1 emissions.[211] This legislation achieves many of the goals of a federal reporting requirement; however, such laws generally do not encompass indirect emissions.[212] Additionally, the varying relationships among state, federal, and administrative reporting requirements is a "patchwork" that could lead to duplication of effort.[213] State legislation, although effective at the local level, is unlikely to provide a uniform national reporting standard because Internet companies are often national corporations with data centers in multiple states.[214] Because of the unique boundary-crossing concerns found in climate-change problems, uniform standards are desirable.[215] Further, companies with facilities in multiple states could take advantage of different state rules by concentrating their facilities in states with less strict or no reporting requirements—a recurring concern in state environmental legislation.[216] Because climate change is a problem on a national scale, this approach will not effectively reduce emissions.

3. Federal Legislation

In the past, federal legislation relating to climate change has focused on either cap-and-trade or a carbon tax.[217] The main criticism to both a cap-and-trade approach and a carbon tax are the costs to the individual consumer, both in implementation and in short-term price inflation "at the pump."[218] Of the two, cap-and-trade is the more expensive.[219] A Congressional Research Report on the cost of implementing either of these systems notes that a policymaker's

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211. *See supra* note 91 and accompanying text.

212. Vandenbergh & Cohen, *supra* note 92.

213. Sheehan & Carr, *supra* note 90.

214. *See* COOK & VAN HORN, *supra* note 2, at 5 (noting that data centers are clustering in states like North Carolina that have an abundance of cheap energy).

215. *See supra* notes 81-83 and accompanying text.

216. *See* PERCIVAL ET AL., *supra* note 15, at 698 ("Congress intended that the effluent limits be uniform throughout the nation for 'similar point sources with similar characteristics,' in part to prevent geographic competition for industry from undermining water pollution control standards.").

217. RAMSEUR & PARKER, *supra* note 87, at 3-7; Kenneth R. Meade, *Federal Climate Change: Update and Opportunities*, WILMERHALE (July 2008), http://www.wilmerhale.com/publications/whPubsDetail.aspx?publication=8369 (noting that the main focus is currently on cap-and-trade).

218. *See* LARRY PARKER, CONG. RESEARCH SERV., RL 33799, CLIMATE CHANGE: DESIGN APPROACHES FOR A GREENHOUSE GAS REDUCTION PROGRAM (2008), http://congressionalresearch.com/RL33799/document.php.

219. RAMSEUR & PARKER, *supra* note 87, at 4.

preference for a cap-and-trade system over a carbon tax should reflect "whether one is more concerned about the possible economic cost of the program and therefore willing to accept some uncertainty about the amount of reduction received [carbon taxes]; or one is more concerned about achieving a specific emissions reduction level with costs handled efficiently, but not capped [tradable permits]."[220] While cap-and-trade would reduce a specific amount of carbon emissions, such a program could become very expensive to implement and yet would not be certain to provide financial returns. Meanwhile, with a carbon tax, the price of implementation would be low, but the actual amount of carbon to be reduced would remain uncertain.[221] Because a large portion of the costs of each program are uncertain, the government can never be sure what kinds of standards to set or how much expense would be involved.[222]

After another climate-change bill, the Lieberman-Warner Climate Security Act, failed to pass in 2008,[223] *Time* magazine noted that the "opposition [to climate change] has found a new, well-fortified position."[224] It argues that politicians who are against climate change can make a powerful argument that "the U.S. cannot adopt a cap on carbon emissions . . . because it would drive up energy prices and wreck the economy."[225] In turn, environmentalists are concerned that the argument about uncertainty will make legislation too watered down to effect significant and timely change.[226] Concerns over cost are exacerbated by the fact that the current poor economic climate has resulted in a lack of public support for environmental policies. [227]

Narrow focus on the two traditional types of climate control can lead to a congressional stalemate when both types have a difficult time passing.[228] As stated above, some members of Congress have already rejected one or both of the traditional suggestions for climate

220. PARKER, *supra* note 218.

221. *Id.*

222. *Id.*

223. Pooley, *supra* note 198.

224. *Id.*

225. *Id.*

226. *See* Skolnikoff, *supra* note 197, at 78 ("Indeed, no major action is likely to be taken until those uncertainties are substantially reduced, and probably not before evidence of warming and its effects are actually visible.").

227. Pooley, *supra* note 198 (describing how political opponents of comprehensive climate-change bills have used the threat of rising costs of gasoline in a bad economy to block climate-change legislation).

228. PERCIVAL ET AL., *supra* note 15, at 158 ("As the Obama administration presses Congress to adopt a national program to control emissions of greenhouse gases, the question of whether a carbon tax or a cap-and-trade approach should be used is being debated."); *see also* RAMSEUR & PARKER, *supra* note 87, at 5-7 (recognizing a possible balance between the carbon tax and cap-and-trade approaches).

change.[229] Thus, when alternative measures are included in bills that support these traditional approaches, the bills are likely to fail because of the political gridlock: For example, in the failed Waxman-Markey Bill, the EPA would have been directed to create a "Greenhouse Gas Registry."[230] That bill also included cap-and-trade, which has had a difficult time passing. Since Waxman-Markey's failure, there has not been a suggestion of a national carbon registry beyond the large-scale emitters included in the reporting requirement.[231]

This dualistic analysis is problematic for another reason: It often leads to gridlock and polarization along party lines. A Republican Party memo outlining a strategy for discounting cap-and-trade based on any incremental increase in the price of gasoline is a perfect example.[232] The memo stated: "[t]he goal is for a theme (example: climate bill equals higher gas prices) each day, and the focus is much more on making political points than in amending the bill . . . or affecting policy."[233] Each of these schemes has a poorer chance of becoming law when it cannot sidestep a price increase,[234] the country is in a recession,[235] and the partisan politics that has delayed climate change in the past does not appear to be dissipating.[236]

III. SOLUTION: AN IMMEDIATE FEDERAL UNIFORM REPORTING REQUIREMENT THAT ENCOMPASSES SCOPE 2 EMISSIONS

Although a reporting requirement alone would not achieve the emissions reduction that a cap-and-trade or a carbon tax could,[237] a federal registry would affect measureable change at a lower cost than either of these schemes. A federal reporting requirement, enacted outside of the CAA, is far less costly than either cap-and-trade or a

229. *See* Romm, *supra* note 194.

230. *See* American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 311, *available at* http://www.govtrack.us/congress/bill.xpd?bill=h111-2454&tab=summary (directing the EPA to issue regulations resulting in a federal GHG registry).

231. *See supra* Part I.A.2 (discussing the requirements of the Greenhouse Gas Reporting Program, at 40 C.F.R. §98 (2006)).

232. Pooley, *supra* note 198.

233. *Id.* (quoting the GOP strategy memo which had been made available by Democratic leader Harry Reid).

234. *Id.*

235. Matthew E. Kahn & Matthew J. Kotchen, *Environmental Concern and the Business Cycle: The Chilling Effect of Recession* 1 (Nat'l Bureau of Econ. Research, Working Paper No. 16241, 2010), *available at* http://www.nber.org/papers/w16241.pdf.

236. *See supra* notes 217-235 and accompanying text.

237. *See generally* RAMSEUR & PARKER, *supra* note 87, at 1 (suggesting that cap-and-trade controls emissions more effectively than the other listed market-based, climate-change option, a carbon tax).

carbon tax, while a uniform standard avoids the problems raised by state legislation and agency regulation.[238] Additionally, this federal legislation will avoid the CAA structure.[239] Although the EPA will probably implement this new legislation, explicit authority from federal legislation will help the EPA avoid a drawn out notice-and-comment period.[240] Finally, this requirement is likely to have an environmentally friendly effect on consumer choice, incentivize industry to create better technology, and allow policymakers to help make more informed decisions in the future.

A. Effect of a Reporting Requirement on Consumer Choice

This relatively inexpensive change[241] can be powerful because of the effect that more information will have on consumer choice. At the individual level, carbon can be reduced both through personal changes in electricity consumption[242] and in the influence that a better environmental policy will have on consumers who might choose to purchase Internet services from companies that use cleaner energy.[243]

Data suggests that when people have access to information about which companies expend the most energy, they will alter their habits to use more efficient energy.[244] This is because environmental issues are generally important to Americans,[245] and a company with better technology is more efficient.[246] Such a company will save more money when energy regulations are enacted, which some think is inevitable.[247] A meaningful comparison will give credit where it is due

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238. *See Guide to Understanding Factors that Affect Verification Costs*, CLIMATE REGISTRY, 3-8 (Feb. 10, 2011), http://www.theclimateregistry.org/downloads/2011/02/2011-02-10-TCR-Guidance-on-Verification-Cost-Factors.pdf (last updated Feb. 10, 2011).

239. *See* Peters, *supra* note 85.

240. *Cf.* United States v. N.S. Food Prods. Corp., 568 F.2d 240, 252 (2d Cir. 1977) (noting that the EPA's response to notice and comments was inadequate because "agencies do not have quite the prerogative of obscurantism reserved to legislatures").

241. *Compare Guide to Understanding Factors that Affect Verification Costs*, *supra* note 238 (noting the relatively low cost of reporting verification), *with* Pooley, *supra* note 198 (noting that additional costs in electricity and gasoline are inevitable in the face of more traditional climate-change options like cap-and-trade).

242. *See supra* note 148.

243. *See* Siebecker, *supra* note 33, at 123-24.

244. *See, e.g.*, Dietz et al., *supra* note 34, at 18452-54 (noting the results of a study indicating the significant effect consumer behavior patterns can have on energy consumption).

245. Kahn & Kotchen, *supra* note 235, at 18.

246. *See* Polastre, *supra* note 168 (suggesting that it is cheaper to have less energy-intensive equipment, both in anticipation of imminent regulations and for the electricity bill); *see also* Andrew Nusca, *HP Opens First Wind-Cooled Green Data Center; Most Efficient to Date*, SMARTPLANET (Feb. 11, 2010, 9:16 AM), http://www.smartplanet.com/blog/smart-takes/hp-open-first-wind-cooled-green-data-center-most-efficient-to-date/4191.

247. *See* Pooley, *supra* note 198 (discussing whether climate change is inevitable).

and allow companies to compete for better energy equipment. Internet company competitors should admire and later emulate innovative strategies. Google appears to be leading the pack in its "green effort"[248] and if it is, it should receive that praise and any competitive benefit. Ultimately, public accountability will help policymakers develop a strategy to account for companies that have a small amount of direct emissions but a disproportionately large amount of indirect emissions.[249]

Further, more information can help consumers alter their usage and thus reduce emissions. A study on the effect of public accountability showed that when consumers had a meter attached to their heaters, they reduced their heat usage.[250] It appears that a large portion of consumers were able to alter their behavior when they had access to clear information about their energy usage.[251] With accurate and complete information from Internet companies, private or public third parties such as Greenpeace can publish information relating to individual usage.[252] These small changes made with a thermostat had a strong effect in the aggregate.[253]

B. Information For Policymakers

Currently, a policymaker interested in regulating carbon emissions lacks data for an industry that consumes a disproportionately large amount of the world's energy.[254] Having the PUE of most Internet companies is not enough because it does not reflect the overall amount of emissions for each company.[255] As mentioned above, some companies use multiple servers to produce a faster search result,[256] so more efficient equipment is not necessarily indicative of the total amount of carbon each company emits. Further, Internet companies calculate their PUE without third-party

248. COOK & VAN HORN, *supra* note 2. Although Google received a few low scores for its climate policy, Google received a relatively high score of "B" for its mitigation policy. *Id.*

249. *See supra* Part II.A.1 (discussing the benefits of considering the emissions attributed to the Internet companies even though they are indirect).

250. Dietz et al., *supra* note 34, at 18454-55 (noting the potential for emissions reduction if behavior is altered at the individual level).

251. *Id.* at 18454 (acknowledging that financial incentives play a significant role in causing behavior modification but in coming years, this change could result from the efforts of grassroots-political organizations working toward combating climate change).

252. *See* COOK & VAN HORN, *supra* note 2.

253. Dietz et al., *supra* note 34, at 18452-54.

254. *See* Vandenbergh & Cohen, *supra* note 92, at 250.

255. *See supra* notes 121-122 and accompanying text.

256. *See* Miller, *supra* note 172; Polastre, *supra* note 168.

verification.[257] This is a significant amount of data unavailable to a policymaker attempting to define a technology-based, economy-based, or emissions-based standard.[258]

IV. CONCLUSION

Internet companies have too large a carbon footprint to remain unregulated.[259] The law should require these companies to have publicly available accounting, which shows where they are spending their energy.[260] The fact that these companies do not emit carbon directly into the atmosphere does not make them any less responsible.[261]

An information-based requirement is less expensive than a more aggressive regulatory scheme and can make each of these schemes more effective by including Scope 2 emissions.[262] Also, the immediate success of either a cap-and-trade or carbon tax scheme seems unlikely. If past experience repeats itself, both regulatory schemes will struggle more in the face of a poor economic climate.[263]

Public reporting will help future regulation by providing more reliable data, which is one of the biggest criticisms facing cap-and-trade.[264] Requiring public reporting so that the enacting agency and third parties can check the data[265] will enable policymakers to make better decisions regarding indirect emissions regulation.[266] This could cut down on the cost of more aggressive regulation in the future.[267] An EPA reporting requirement for indirect energy emissions that surpasses a statutorily defined threshold is an effective and economically sound measure.

A uniform federal standard should remove some of the competitive concerns companies have raised in opposition to proposed reporting requirements. Without more information, companies should

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257. *See supra* Part I.C.

258. PERCIVAL ET AL., *supra* note 15, at 638. (technological standard); Loper & Parr, *supra* note 30, at 15-16 (economic and emissions standard).

259. *See* Dubash, *supra* note 21.

260. *Id.*

261. *See, e.g.*, *Yahoo! Information Request*, *supra* note 25.

262. *See supra* note 241 and accompanying text.

263. *See* Kahn & Kutchen, *supra* note 235, at 16 (noting a decrease in public interest in environmental policies during economic downturns); *see also supra* Part II.B.3.

264. PARKER, *supra* note 218.

265. *See* Cappiello, *supra* note 152.

266. Loper & Parr, *supra* note 30, at 15-16.

267. With better information, policymakers may be able to enact regulation like the suggested registry, and avoid the stalemate produced by more aggressive regulation, such as a carbon tax or cap-and-trade. *See supra* notes 228-231 and accompanying text.

not be able to claim that disclosure harms competition, both because it is not clear why their innovations would be revealed to their competitors through emissions accounting and because Google's recent high profile disclosure undercuts this assertion altogether.[268] Finally, it is unfair for these companies to self-regulate but still make claims as to their relative neutrality[269] when this might be giving them an unfair advantage in the marketplace.[270]

If it is true that stricter energy regulations are "inevitable,"[271] then Internet companies should welcome a uniform accounting of their energy needs. A cost-benefit analysis will be at the heart of any energy policy,[272] and while current cap-and-trade probably would not affect indirect emissions, a stringent carbon tax could be difficult for Internet companies.[273]

Federal legislation resulting in a public carbon registry depicting Internet companies' total emissions will aid policymakers in targeting the main sources of indirect emissions. Internet companies should not be allowed to act "green" and simultaneously refuse to disclose their total emissions. Internet companies provide an important service and are more environmentally friendly than other mass communication options like faxing and printing.[274] Although it is important to protect their competitive trade secrets, it appears that Internet companies have overstated their need for secrecy on this point. Public accountability will allow policymakers to craft the best standard from a cost-benefit point of view. More information will lead to more effective policy for both the environment and the industry.

*Alexandra L. Pichette**

268. Albinson, *supra* note 24.

269. *See supra* Part II.A.

270. Siebecker, *supra* note 33, at 123-24.

271. *See* Pooley, *supra* note 198.

272. For example, the Administrative Procedure Act requires agencies to consider cost in their decision-making. § 5 U.S.C. § 551(4) (2006).

273. *See supra* note 133.

274. Stansberry, *supra* note 127.

* J.D. Candidate, Vanderbilt University Law School, 2012; B.A., Tulane University. The author would like to thank Professor Michael Vandenbergh for his insight and comments, and would like to thank the editorial staff of the VANDERBILT JOURNAL OF ENTERTAINMENT AND TECHNOLOGY LAW.